

CS 429 Homework 13

Name: _____ Section #: _____

Instructions: As usual, you may collaborate with your classmates and ask for assistance from the TA. But don't copy anyone else's answer.

1. Protein string matching code currently takes around 4 days of execution time on the current machine. 20% of time is spent doing integer instructions and 35% doing i/o. Which is the better optimization?
 - (a) Compiler optimization that reduces the number of integer instructions by 25%, assuming each integer instruction takes the same amount of time.
 - (b) Hardware optimization that reduces the latency of each i/o operation from 6ms to 5ms.
2. Recent advances in process technology quadrupled the number of transistors you can fit on a die. Currently your customer uses up to 4 processors for 40% of their application. Which of the following optimizations gives the most improvement?
 - (a) Increase the number of processors from 1 to 4.
 - (b) Use 2 processors but add features that will allow applications to use them for 80% of execution.
3. Complete the leet code easy problem Univalued Binary Tree located at leetcode.com/problems/intersection-of-two-linked-lists in C. Include the function in your submission for this homework. Hint: Check your answer on leet code before submitting.
4. **This question is optional. It won't be graded.** Do problem 7.6 on p. 714 of Bryant and O'Hallaron.